This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (cancelled)

2. (cancelled)

3. (previously presented) A volumetric stationary CT system comprising:

at least one stationary detector comprising a plurality of detector elements of more than one sizes placed in the at least one stationary detector, wherein the at least one stationary detector extends generally around at least a portion of an imaging volume;

at least one stationary distributed X-ray source placed proximal to the at least one stationary detector; and

a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector,

wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction.

4. (previously presented) A volumetric stationary CT system comprising:

at least one stationary detector extending generally around at least a portion of an imaging volume; at least one stationary distributed X-ray source placed proximal to the at least one stationary detector; and

a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector,

wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction, and

wherein the at least one stationary distributed X-ray source includes at least two full ring sources.

5. (previously presented) The system of claim 4, wherein the at least two full ring sources include at least one of a circle, a rectangle, a square, an ellipse, an oval, and a loop configuration.

6. (previously presented) The system of claim 4, wherein the at least one stationary detector includes a pair of ring detectors and wherein at least one ring source of the at least two full ring sources is positioned between the pair of ring detectors.

7. (previously presented) The system of claim 6 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

8. (original) The system of claim 4, wherein the at least one stationary detector includes one or more ring detectors placed between two or more ring sources.

9. (previously presented) The system of claim 8 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

10. (original) The system of claim 8, wherein the at least one stationary detector comprises one full ring detector placed between two full ring sources.

11. (previously presented) The system of claim 10 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

12. (previously presented) The system of claim 8, wherein the at least two ring sources are placed immediately adjacent to the stationary detector and additional ring sources are placed at spaced-apart locations on either side thereof.

13. (previously presented) The system of claim 12 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

14. (previously presented) The system of claim 8, wherein the two or more ring sources include a plurality of spaced-apart ring sources for emitting radiation, and the at least one stationary detector includes a plurality of ring detectors being positioned between the spaced-apart ring sources for receiving the radiation.

15. (previously presented) The system of claim 14 further comprising two or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

16. (original) The system of claim 4 further comprising one or more partial ring sources and wherein the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources and includes the one or more partial ring sources.

17. (original) The system of claim 4, wherein the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources, wherein the one or more ring detectors and the two or more ring sources comprise different diameters for permitting a telescoping movement of the one or more ring detectors with the two or more ring sources.

18. (previously presented) A volumetric stationary CT system comprising:

at least one stationary detector extending generally around at least a portion of an imaging volume; at least one stationary distributed X-ray source placed proximal to the at least one stationary detector;

one or more line sources extending at least along a Z-direction; and

a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector,

wherein the at least one stationary detector, the at least one stationary distributed X-ray source, and the one or more line sources are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction.

19. (currently amended) A volumetric stationary CT system comprising:

at least one stationary ring detector extending generally around at least a portion of an imaging volume;

~~one or~~ more than one partial ring sources flanking the stationary ring detector on alternating sides of the stationary ring detector and configured to emit radiation toward the ring detector; and

a source controller for triggering one or more emitters in the one or more partial ring sources for acquiring volumetric data by the at least one stationary ring detector,

wherein the at least one stationary ring detector, and the one or more partial ring sources are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction.

20. (currently amended) The system of claim 19 further comprising one or more line sources ~~line sources~~ extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

21. (previously presented) The system of claim 19, wherein the at least one stationary ring detector includes one or more notched detectors.

22. (original) The system of claim 21, wherein the one or more notched detectors include a partial ring detector, and wherein the one or more partial ring sources extend within notches of the partial ring detector.

23. (previously presented) The system of claim 21 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

24. (original) The system of claim 21, wherein the one or more notched detectors include at least two notched detectors for receiving the one or more partial ring sources and configured to be combined along the Z-direction to generally surround the imaging volume.

25. (previously presented) The system of claim 24 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

26. (previously presented) A volumetric stationary CT system comprising:

at least one stationary detector extending generally around at least a portion of an imaging volume; at least one stationary distributed X-ray source placed proximal to the at least one stationary detector; and

a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector, wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction, wherein the at least one stationary detector includes a helical detector, and wherein the at least one stationary distributed X-ray source includes a helical source placed adjacent to the helical detector.

27. (original) The system of claim 26, wherein at least one of the helical source and the helical detector forms a plurality of turns around the imaging volume.

28. (cancelled)

29. (cancelled)

30. (previously presented) An X-ray imaging system for scanning a volume to be imaged, the system comprising:

at least one stationary distributed X-ray source extending generally around at least a portion of an imaging volume and configured to emanate an X-ray radiation;
at least one stationary detector comprising a plurality of detector elements of more than one sizes placed in the at least one stationary detector for receiving the X-ray radiation after attenuation in the imaging volume and placed proximal to the at least one stationary distributed X-ray source;

a control circuit operably coupled to the at least one distributed X-ray source, wherein the control circuit is configured for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector;

a processing circuit operably coupled to the at least one detector and configured to receive the plurality of projection images and to form one or more reconstructed slices representative of the volume being imaged; and

an operator workstation operably coupled to the processing circuit configured to display the one or more reconstructed slices,
wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction.

31. (previously presented) An X-ray imaging system for scanning a volume to be imaged, the system comprising:

at least one stationary distributed X-ray source extending generally around at least a portion of an imaging volume and configured to emanate an X-ray radiation;

at least one stationary detector for receiving the X-ray radiation after attenuation in the imaging volume and placed proximal to the at least one stationary distributed X-ray source;

a control circuit operably coupled to the at least one distributed X-ray source, wherein the control circuit is configured for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector;

a processing circuit operably coupled to the at least one detector and configured to receive the plurality of projection images and to form one or more reconstructed slices representative of the volume being imaged; and

an operator workstation operably coupled to the processing circuit configured to display the one or more reconstructed slices,

wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction,

wherein the at least one stationary distributed X-ray source includes at least two full ring sources.

32. (previously presented) The system of claim 31, wherein the at least one stationary detector includes a pair of ring detectors and wherein at least one ring source of the two or more full ring sources is positioned between the pair of ring detectors.

33. (previously presented) The system of claim 32 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

34. (original) The system of claim 31, wherein the at least one stationary detector includes one or more ring detectors placed between two or more ring sources.

35. (original) The system of claim 34, wherein the at least one stationary detector comprises one full ring detector placed between two full ring sources.

36. (previously presented) The system of claim 34, wherein the at least two ring sources are placed immediately adjacent to the stationary detector and additional ring sources at spaced-apart locations on either side thereof.

37. (previously presented) The system of claim 34, wherein the two or more ring sources include a plurality of spaced-apart ring sources for emitting radiation, and the at least one stationary detector includes a plurality of ring detectors being positioned between the spaced-apart ring sources for receiving the radiation.

38. (original) The system of claim 31 further comprising one or more partial ring sources and wherein the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources and includes one or more partial ring sources.

39. (original) The system of claim 31, wherein the at least one stationary detector includes one or more ring detectors positioned between two or more ring sources, wherein the one or more ring detectors and the two or more ring sources comprise different diameters for permitting a telescoping movement of the one or more ring detectors with the two or more ring sources.

40. (previously presented) The system of claim 31 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

41. (previously presented) The system of claim 31, wherein the at least one stationary detector includes a ring detector and wherein the at least one stationary distributed X-ray source includes one or more partial ring sources flanking the ring detector on alternating sides of the ring detector and configured to emit radiation toward the ring detector.

42. (previously presented) The system of claim 31, wherein the at least one stationary distributed X-ray source includes one or more partial ring sources and wherein the at least one stationary detector includes one or more notched detectors.

43. (previously presented) The system of claim 31, wherein the at least one stationary detector includes a helical detector, and wherein the at least one stationary distributed X-ray source includes a helical source placed adjacent to the helical detector.

44. (cancelled)

45. (previously presented) A method of X-ray imaging comprising:

providing at least one stationary detector extending generally around at least a portion of an imaging volume;

providing at least one stationary distributed X-ray source placed adjacent to the at least one detector configured to emit radiation toward the detector;

providing a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector, wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction; and

measuring additional data by employing line sources.

46. (previously presented) A method of X-ray imaging comprising:

providing at least one stationary detector extending generally around at least a portion of an imaging volume;

providing at least one stationary distributed X-ray source placed adjacent to the at least one detector configured to emit radiation toward the detector;

providing a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector,

wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction; and

providing one or more ring detectors placed between two or more ring sources.

47-48. (cancelled)

49. (previously presented) The method of claim 46 wherein at least one of a source and a detector is configured to make a telescopic movement for allowing adaptive Z-coverage.

50-58 (cancelled)

59. (previously presented) The system of claim 4 further comprising detector elements having varying resolutions and forming the at least one stationary detector, wherein the at least one stationary detector extends generally around a portion of an inner surface of the volumetric stationary CT system.

60. (previously presented) A volumetric stationary CT system comprising:

at least one stationary detector comprising detector elements having varying resolutions and forming the at least one stationary detector extending generally around at least a portion of an imaging volume;

at least one stationary distributed X-ray source placed proximal to the at least one stationary detector; and

a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least one stationary detector,

wherein the at least one stationary detector and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction.

61. (previously presented) A volumetric stationary CT system comprising:

at least two stationary detectors extending generally around at least a portion of an imaging volume; at least one stationary distributed X-ray source placed proximal to the at least one stationary detector; and

a source controller for triggering one or more emitters in the at least one stationary distributed X-ray source for acquiring volumetric data by the at least two stationary detectors, wherein the at least two stationary detectors and the at least one stationary distributed X-ray source are configured to cooperate to contribute towards mathematical completeness of acquired volumetric data for image reconstruction.

62. (currently amended) The system of claim ~~62~~ 61 further comprising one or more line sources extending at least along a Z-direction to increase mathematical completeness in acquired volumetric data for image reconstruction.

63. (new) The system of claim 3 wherein the one or more emitters comprise at least one of thermionic emitters, carbon-based emitters, photo emitters, ferroelectric emitters, cold-cathode emitters, laser diodes and monolithic semiconductors.

64. (new) An X-ray imaging system of claim 30 wherein the one or more emitters comprise at least one of thermionic emitters, carbon-based emitters, photo emitters, ferroelectric emitters, cold-cathode emitters, laser diodes and monolithic semiconductors.